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GAME SPORTS

The sports described in this chapter promote both aerobic and anaerobic physical conditioning as well as skill development. For best results, they should be combined with a pure aerobic type of activity and a program of weights, stretching, and calisthenics. Proper warm-up and cool-down exercises will be necessary (see Chapters 5 and 6). There are many other game sports that require skill but are less strenuous and do not offer high-level aerobic benefits, such as golf, bowling, and baseball.

Handball, tennis, racquetball, squash, basketball, soccer, hockey, and lacrosse are good supplemental activities to a regular physical conditioning program because they are relatively strenuous sports that provide good aerobic exercise, especially if played on a regular basis. They require and maintain both aerobic and anaerobic conditioning. These sports are not as repetitive in their motions as are running, rowing, swimming, bicycling, or cross-country skiing. The games emphasize strategy and a variety of actions to score points against opponents.

As in any sport, the player must develop the ability to perform the basic skills required: running (sprinting short distances or running down a field or court); ball-handling or racquet/stick skills that require good hand-eye coordination; and upper-body strength. Soccer requires strenuous use and coordination of the lower limbs. All of the games discussed in this chapter develop a sense of quickness and balance.

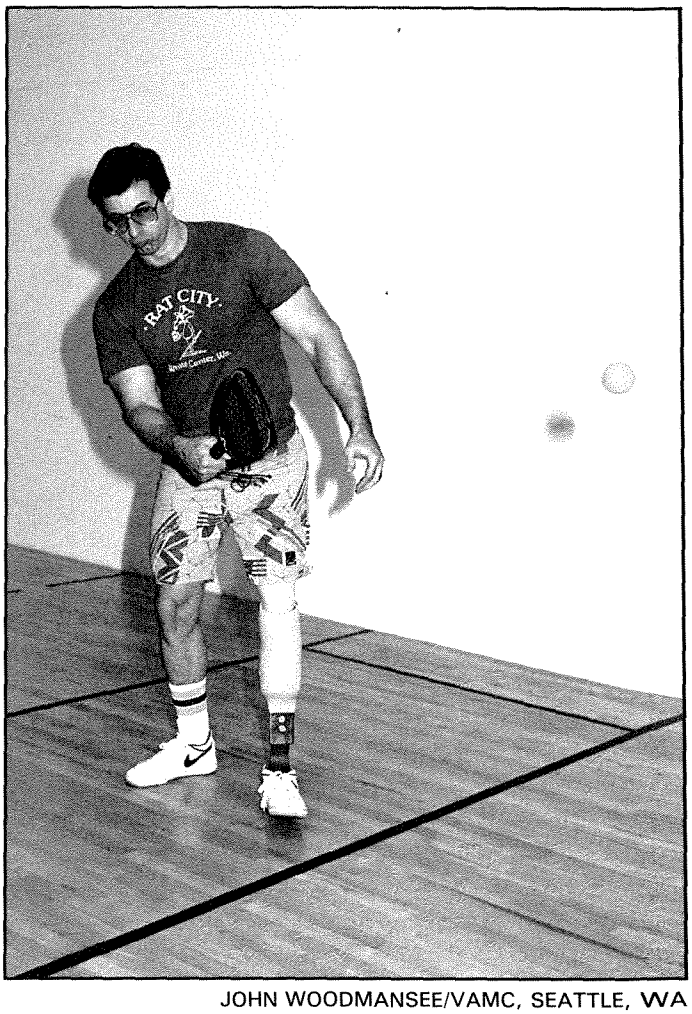
Once the game skills are mastered, the player must have the strength and muscular endurance needed for distance running, as well as the flexibility and agility needed for quick body movement. These are necessary in order to prevent injuries and will contribute to the satisfaction of high performance in play. It is always best to begin a new activity slowly and work up to full potential gradually. Thus, it may take time to become fit enough to keep up with the others in an active game sport.

Most game sports are not continual steady-state exercise, which often makes it difficult to monitor aerobic progress. Time-outs, brief rest periods, or other interruptions in the game allow the pulse to drop momentarily during the course of play. Because a good aerobic training program requires maintenance of a target heart rate for 20 to 30 minutes, at least 3 times per week, one must train for longer periods when using game activities for aerobic conditioning.

Endurance levels increase more rapidly in game sports when the participant also engages in some form of steady-state exercise on a regular basis (e.g., running or swimming). Many athletes run and/or lift weights during the off-season, which increases their strength and aerobic capacity. Thus, they are in better condition for competition in the regular game season during which a reduced program of running, weight lifting, and calisthenics is continued for fitness maintenance.

Handball, tennis, racquetball, and squash require fast reflexes and agility. Individuals with lower limb loss may prefer racquetball over other racquet sports because of the smaller court size involved and

STEVE WILBER, SEATTLE, WA
Kevin Wilson had a collegiate soccer scholarship just prior to losing his left leg below the knee. He now competes in both crutch soccer and stand-up soccer leagues with nondisabled players.



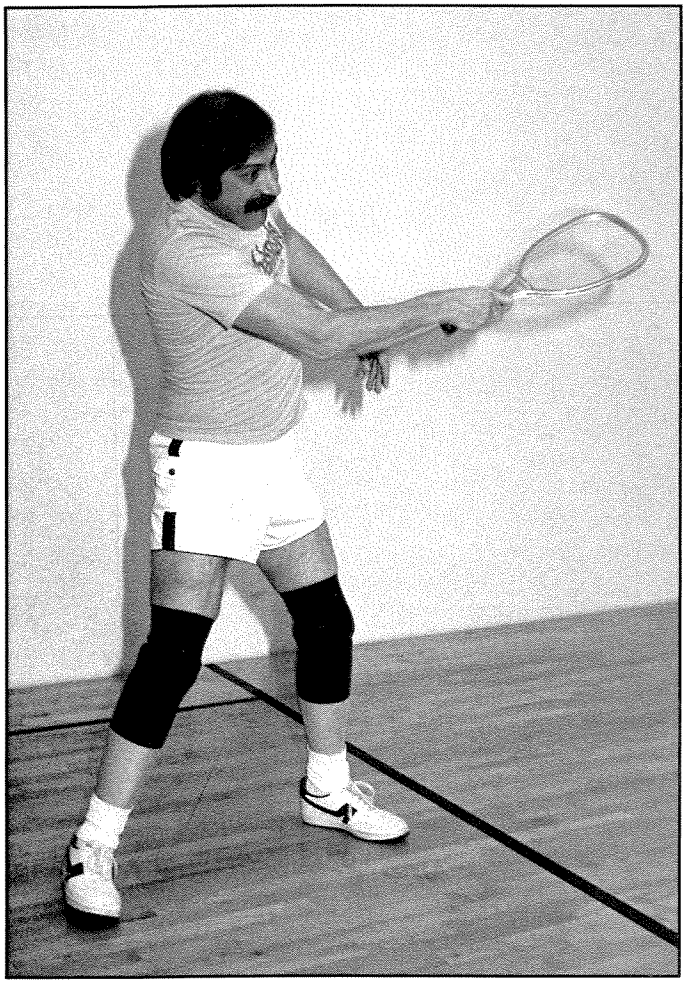
JOHN WOODMANSEE/VAMC, SEATTLE, WA
Mike Nitz, serving a ball during a racquetball game, wears a CAT/CAM Flexible Brim AK Suction Socket, Mauch SNS Knee Unit with the Flex-Foot prosthesis.

the shorter distance to be covered when running. However, speed is essential and there is less time to react when playing on a smaller court. Speed can be a problem when competing with nondisabled players; therefore, a player with a disability has to develop game strategies and good ball placement in order to be competitive.

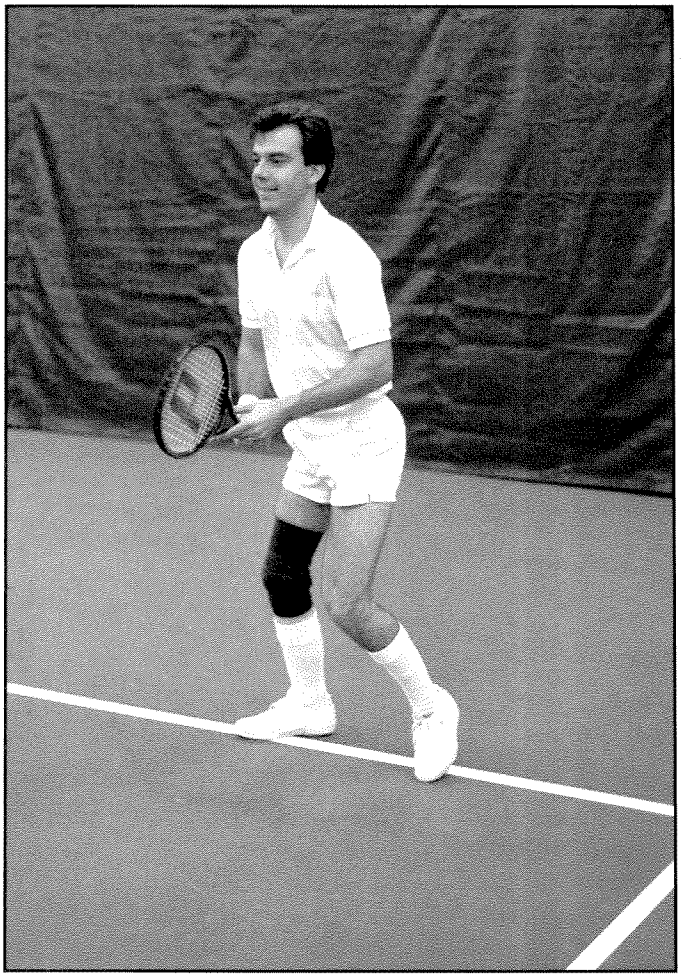
Throughout the game, the player must be able to run (when necessary) in order to get adequate cardiovascular exercise from the activities. Therefore, the prosthesis must fit the residual limb well. If not, blisters or skin irritation will occur and prosthetic adjustments may be necessary. If complications persist, it may become necessary to choose another activity.

Hockey, lacrosse, soccer, and basketball require continuous movement by the players; a lot of distance is covered on the field or court during the course of the game. The person with lower limb loss who cannot keep up the required pace probably will not get an adequate aerobic workout, and the player may not fully enjoy the game. However, for someone who really wants to play one of these sports, there are some options. One option would be to select a position on the field that does not require a great deal of running, such as goalie. Although this would allow for participation as an effective member of the team, it would limit the aerobic benefits of an active team sport.

Hockey and lacrosse involve the use of a stick to maneuver the ball and require the player to cover



JOHN WOODMANSEE/VAMC, SEATTLE, WA
John Everett drives a hard shot into the wall. He uses Seattle Feet and the ActivSleeve Suspension system on his exoskeletal prostheses.

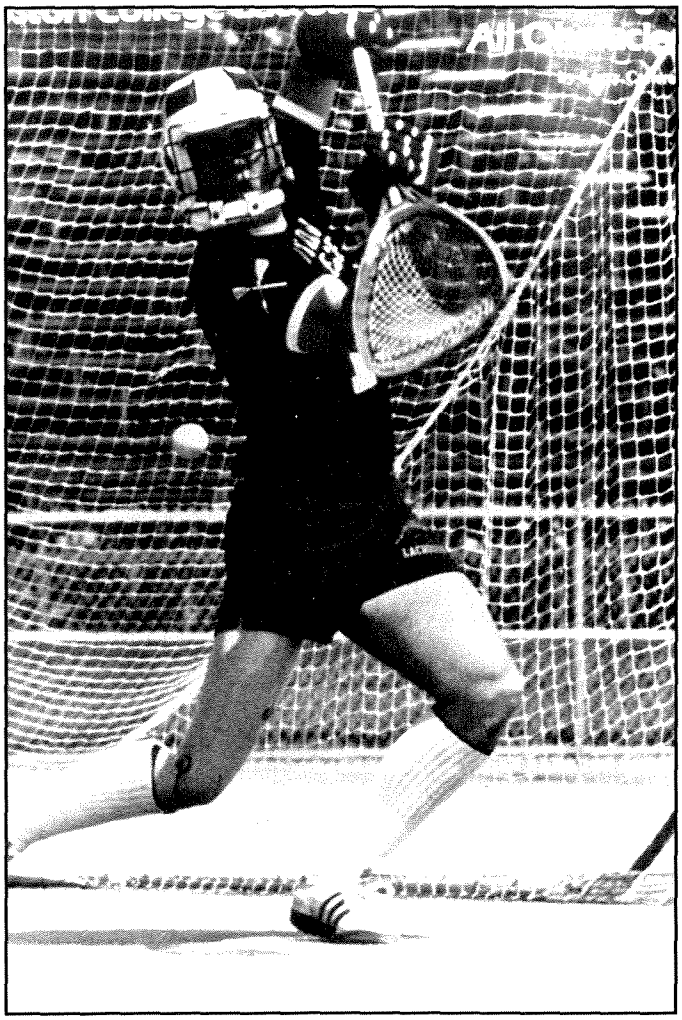


MARTIN BRUMER, SANTA MONICA, CA
Scott Fickenscher demonstrates his skill as an accomplished tennis player. He wears a Seattle Foot and Ankle with Otto Bock adapters, New Skin protective coating on the endoskeletal foam cover, PM Liner, DAW Sheath, and the ActivSleeve Suspension System.

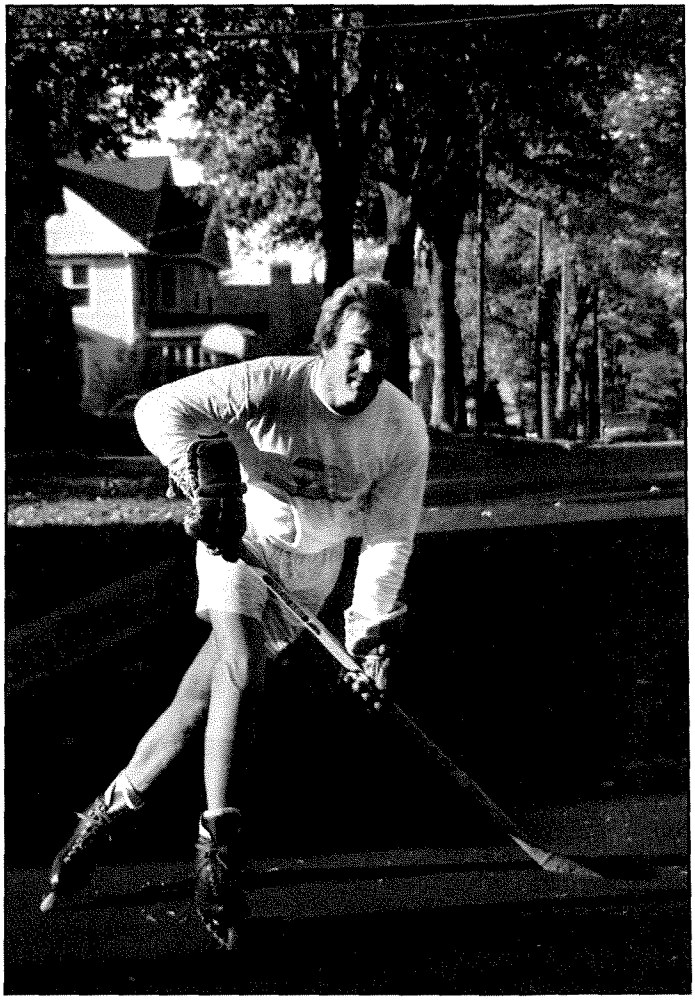
distances at a fast pace. **Roller hockey or ice hockey** may be better choices for the person with lower limb loss than would field hockey because no running is involved. These sports are comparatively nontraumatizing to the residual limb because they require movement of the legs in a gliding motion, which does not have the vertical impact of running. In roller or ice hockey, a person who is disabled can compete more favorably with nondisabled opponents.

People with lower limb loss often find roller hockey easier to play than ice hockey because the wheels of the roller skates provide a wider base than the blade does on ice skates. There is also more ankle mobility allowed in roller-skating because of the adjustability of the trucks that attach to the skate wheels. Beginners should start with roller skates rather than roller blades, which require greater balance.

When ice-skating, some people with BK amputation find that leaning their prosthesis forward over the ball of the foot helps them maintain balance and aids in push-off. This may require a special alignment of the prosthesis, or modification of a walking prosthesis (by adding wedges to the heel) to make the prosthetic leg lean forward. Individuals with AK amputations will find ice- or roller-skating difficult because of problems with knee stability (those with the Mauch SNS Knee Unit will find it easier to ice- or roller-skate when it is combined with the Endolite ESK unit).



CHARLIE FRIED/ABILITY MAGAZINE, LOS ANGELES, CA
Jeff Keith plays goalie on the varsity lacrosse team at Boston College.



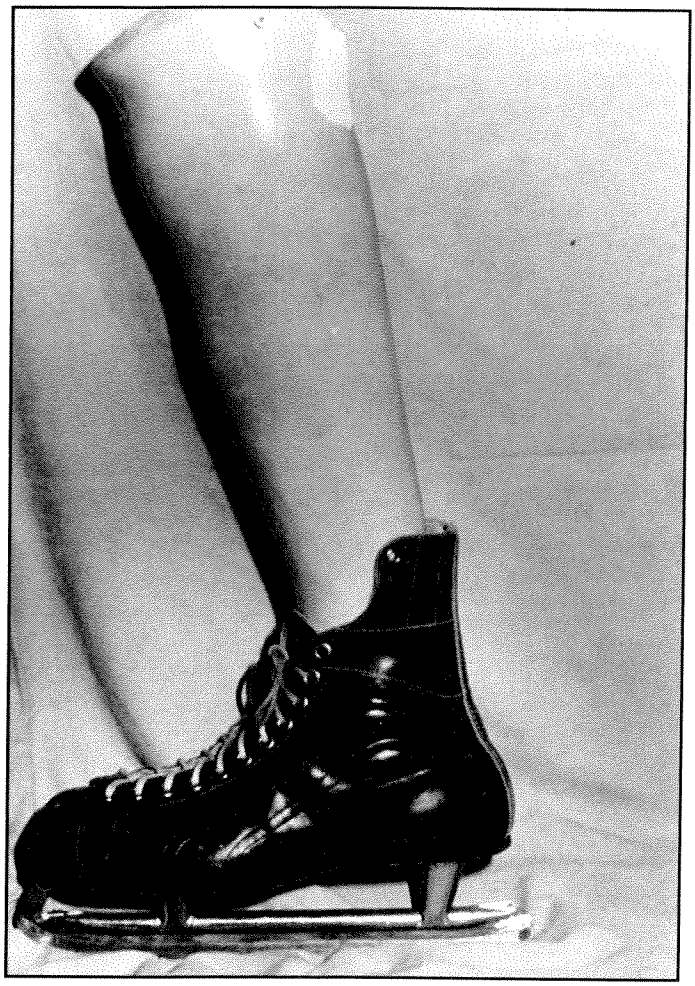
INSTITUTE FOR THE ADVANCEMENT OF PROSTHETICS, LANSING, MI
Dale Conlin is shown roller-blading. He wears a total-surface-bearing socket design, Peyton Massey silicone gel insert, latex Michigan sleeve suspension, Otto Bock titanium components, Seattle Foot, and New Skin cosmesis.

Soccer is very demanding on the legs. Although some athletes with disabilities can keep up with the nondisabled in playing soccer on a full field, most find there is too much strenuous running and kicking involved for them to be competitive. Indoor soccer, which has a smaller "field," is a good alternative.

People who find it difficult to run while wearing a prosthetic leg can still play soccer by removing the prosthesis and using crutches. Don Bennett of Seattle, Washington, has developed **crutch soccer**, a new form of soccer for nondisabled players and those with disabilities. Crutch soccer is fast-moving, very competitive, and provides an excellent muscular and aerobic workout. Teams can be made up of players with and without disabilities. All players use crutches, but may not hit the ball with them. The nondisabled players must keep one leg off the ground at all times (it must be the same leg throughout the game). The nondisabled players soon realize the challenge of playing on crutches.

The crutch soccer team in Seattle has hosted several international tournaments; coach Bill Barry has traveled extensively to promote the game throughout the United States, Canada, South America, England, and the former Soviet Union.

Basketball is one of the fastest-moving team sports. Playing it requires agility in jumping and running and a high degree of ball-handling skill. The most difficult challenges for those with lower limb



PROSTHETICS RESEARCH STUDY, SEATTLE, WA
Modifications have been made to this below-knee prosthesis to move the weight line forward in order to accommodate the leg position for ice skating. In the forward lean shown, the socket falls over the middle section to the ball of the foot.

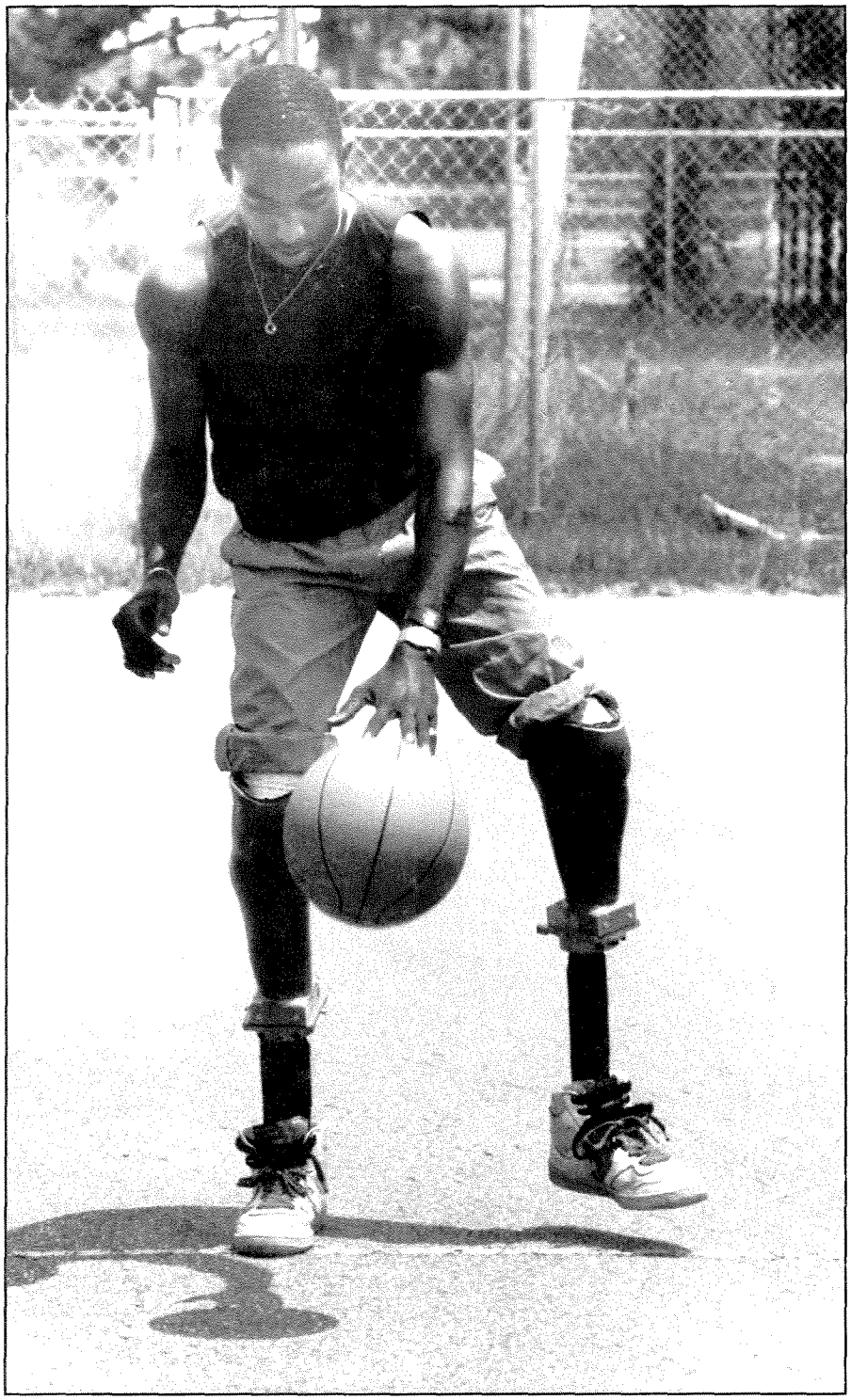
SEATTLE TIMES, SEATTLE, WA
Steve Wilber (center) of the Seattle Crutch Soccer Team is in control of the ball.

amputation are changing direction quickly while running, and running the distances required without getting blisters.

Regardless of the nature and level of amputation and the condition of the residual limb, the best-fitting prosthesis may still not be adequate for running during an entire game of basketball. But there are other ways to be effective in the game, such as developing sharp aim and shooting skills. Outside perimeter shooting ability will certainly enhance a person's value as an effective member of the team.

Individuals who simply cannot tolerate the pressure caused by continuous running will find it too difficult to participate in full-court basketball. Playing half-court basketball, where less running is required, can be an enjoyable alternative. There is also the option of playing wheelchair basketball. This is often a good choice for those with high-level and bilateral AK amputation or hip disarticulation. There are competitive leagues and tournaments in many communities throughout the United States, and wheelchair basketball teams are very popular.

On the national level, competitive basketball tournaments for persons with disabilities are sponsored each year by the U.S. Amputee Athletic Association and the National Wheelchair Basketball Association.



VERN MILLER/NEWS-HERALD, PANAMA CITY, FL

Tim Flowers practices dribbling with his newly-fitted Flex-Feet, which are still on their alignment units.